Charting the rise and demise of a phonotactically motivated change in Scots

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Abstract

Although Old English [f] and [v] are represented unambiguously in Older Scots orthography by <f> and <v> (or <u>) in initial and morpheme-internal position, in morpheme-final position <f> and <v>/<u> appear to be used interchangeably for both of these Old English sounds. As a result, there is often a mismatch between the spellings and the etymologically expected consonant. This paper explores these spellings using a substantial database of Older Scots texts which have been grapho-phonologically parsed as part of the *From Inglis to Scots* (FITS) project. Three possible explanations are explored for this apparent mismatch: (1) it was a spelling-only change; (2) there was a near merger of /f/ and /v/ in Older Scots; (3) final [v] devoiced in (pre-)Older Scots but this has subsequently been reversed. A close analysis of the data suggests that the Old English phonotactic constraint against final voiced fricatives survived into the pre-Literary Scots period, leading to automatic devoicing of any fricative that appeared in word-final position (a version of hypothesis 3), and this, interacting with final schwa loss, gave rise to the complex patterns of variation we see in the Older Scots FITS data. Thus, this devoicing of [v] in final position was not just a phonetically natural sound change, but also one driven by a pre-existing phonotactic constraint in the language. This paper, then, provides good evidence for the active role of phonotactic constraints in the development of sound changes, suggesting that phonotactic constraints are not necessarily at the mercy of the changes which conflict with them, but can be involved in the direction of sound change themselves.

1. Introduction

Between the Old English (OE) period and the early Middle English (ME) and Older Scots (OSc) periods there was a set of changes which transformed the phonological shape of the language and its phonotactic constraints. These extensive changes include degemination (Lass 1992; Minkova 2014: 80-81), unstressed vowel reduction and final unstressed vowel loss (Minkova 1991; Lass 1992), phonemicisation of the voiced/voiceless contrast in fricatives (Minkova 2011), and interdependent changes in vowel quantity and syllable weight (Bermúdez-Otero 1998, Lass 1992, Ritt 2005). As historical phonologists, we want to understand not only how these changes happened but also the role that phonotactic constraints played in them and resulted from them. Just to take as a single example, which will be explored in detail in this paper, how did the OE phonotactic constraint on the distribution of voicing in fricatives and the loss of unstressed final vowels interact? In OE, voiced fricatives could only occur between voiced sounds, and thus could not occur word-finally (see for instance Campbell 1959: 197-180). But after the OE period unstressed final vowels first reduced to [ə] and then disappeared. The result was that formerly intervocalic [v] now appeared in final position, in contravention to the OE phonotactic constraint. This is one of the changes which destroyed the

OE constraint, and helped to create the phonemic distinction between /f/ and /v/ (cf. Minkova 2014: 89-98). But is that necessarily what happened in all descendants of OE? Why did the sound change (schwa loss) lead to change in the phonotactic constraint, rather than the phonotactic constraint affecting the change, and are phonotactic constraints at the mercy of the changes which conflict with them, or are they involved in the direction of sound change themselves (see the issues discussed in Honeybone, this volume)? Answering questions of this type requires us to carefully analyse the order in which changes took place and any possible interactions between them, and for this we need detailed records of earlier stages of the language.

However, it is often the case that data directly relevant to questions of this sort in historical varieties are sparse and difficult to assemble into a coherent narrative. But with the creation of large online databases of earlier records of the language, we are now in a position to analyse the history of these changes in a way which has never been possible before. This paper describes how one such database, the *From Inglis to Scots* (FITS) corpus of OSc grapho-phonological correspondences (Alcorn et al. forthcoming), reveals complex patterns of variation in the graphemic representation of final labiodental fricatives in the 15th century. A detailed investigation of these patterns shows that the variation apparent in the FITS data is not random, but in fact results from the interaction of the continuing constraint against final voiced fricatives and the loss of final unstressed schwa. As such this paper provides good evidence for the active role of phonotactic constraints in the development of sound changes.

This paper is organised as follows. Section 2 describes the FITS corpus and its linguistic context. Section 3 outlines the nature of variation in the representation of final labiodental fricatives in the FITS corpus and suggests possible explanations for this variation, which on the face of it appears to involve devoicing of OE [v] when it came into final position after schwa loss. In Section 4, the relevant data in the FITS corpus are laid out, so that the suggested explanations in Section 3 can be assessed, and in Section 5 the extent to which these explanations account for the data is determined. Section 6 offers concluding remarks on the value of this study, not only for understanding the phonological history of OSc (and English more widely), but also the value of the FITS corpus for demonstrating what we can learn from carefully constructed corpora of earlier stages of the language, and the importance of interpreting evidence for sound change in the context of the phonotactic constraints of the language at the time.

2. From Inglis to Scots

'Scots' (see Alcorn et al. 2017, and Maguire 2012, 2015 for an overview) is the name of the Insular West Germanic variety (or group of varieties) spoken in Lowland Scotland and parts of Ulster. Like English, Scots derives from OE, specifically as a result of the spread of northern ME into the Lowlands of Scotland in the 12th and 13th centuries. Although this variety, which we call Older Scots (OSc), remained linguistically close to northern Middle English (Williamson 2002), it became an autonomous language, subject to its own linguistic and orthographic developments (though many of these have parallels in English). However, with the loss of its autonomy from English in the 17th century and the establishment of diglossia and then diaglossia with English in subsequent centuries, the linguistic status of Scots has become

debatable. Nevertheless, traditional dialects of Scots in the 20th and early 21st centuries are characterised by significant phonological divergence from English.

As part of an extensive study of the phonological structure of OSc and its orthographic manifestations, we have developed a technique of grapho-phonological parsing (Kopaczyk et al. 2018), which we have applied to the Germanic lexis in the corpus of 1,200 texts written in Scots between 1380 and 1500, which collectively underpin *A Linguistic Atlas of Older Scots* (LAOS, Williamson 2008). Our technique, first, resolves each form of each morpheme into a sequence of spelling units. Each spelling unit is then assigned an OSc sound value, which in turn is assigned a corresponding sound value for its pre-Scots input variety (typically Old English if not Old Northumbrian (ONhb) in particular; less often Old Norse or Middle Dutch). The resulting corpus – the FITS Corpus – is therefore a database of correspondences between OSc spelling units and their synchronic and immediate pre-Scots sound values. For example, we resolve OSc *gowd* 'gold' into <g> for OSc [g], <ow> for OSc [ɔʊ], and <d> for OSc [d], and associate these spelling units with Old Northumbrian (ONhb) [g], [ol] and [d] respectively. The development of ONhb [g] and [d] > OSc [g] and [d] is straightforward, but that of ONhb [ol] > OSc [ɔʊ] is not. We therefore additionally identify the relevant developments, which we list and describe in a separate 'Corpus of Sound Changes'. The end result is a richly explicated form history, e.g. ONhb [gold] undergoes Short Vowel Lowering (SVL) > [gɔld], then undergoes pre-L diphthongisation (PLD) > [gɔʊld], which then undergoes L-vocalisation (LV) > OSc [gɔʊd]. A separate 'Corpus of Spelling Changes' completes the story by listing and describing all spelling developments, such as the use of <ow> for OSc [ɔʊ].[1]

As well as providing (a) individual form histories and (b) a full inventory of examples of each documented sound or spelling development, the FITS corpus can identify and display (c) all OSc reflexes of any given pre-Scots sound value and, conversely, (d) all pre-Scots sources of any given OSc sound value. Moreover, results for (c) and (d) can be tailored to particular contexts, defined in terms of position within the syllable, morpheme or word, or in terms of neighbouring segment(s). The FITS corpus is thus a uniquely powerful tool for investigating phonotactic phenomena in OSc, as this paper will show. (For further information about the FITS corpus, see Alcorn et al. 2017.)

3. Developments of OE /f/ in Scots

Modern Scots (ModSc) and English have much in common, which reflects their shared ancestry and intertwined history. With reference to the labiodental fricatives which are the subject of this paper, for example, both English and Scots have similar developments of OE /f/ and indeed retain largely unchanged pronunciations of this consonant, despite important phonotactic changes through the centuries affecting its status and distribution. The pronunciation of /f/ in OE, like the pronunciation of /θ/ and /s/, was subject to well known allophonic conditioning (Minkova 2011). In initial and final position, and next to a voiceless consonant, OE /f/ was pronounced [f], whilst in other positions (i.e. between voiced sounds) it was pronounced [v]. In the post-OE period this allophonic distribution was replaced by a phonemic distinction between /f/ and /v/ as a result of a number of 'conspiring' factors:

[1] Our form histories and supporting corpora of changes are conceptually indebted to Roger Lass and his CoNE project (Lass et al. 2013).

borrowings from French (e.g. *very*) and English dialects (e.g. *vixen*) with voiced fricatives, degemination of OE /ff/ (> [f] intervocalically, e.g. *offer*), and loss of unstressed final vowels (so that OE intervocalic [v] came to stand in word-final position, e.g. *live* (v.)). These changes notwithstanding, the etymological distribution of original OE [f] and [v] has largely remained unchanged in ModSc and English, though there has been some loss of [v] in intervocalic and final position in Scots and northern English dialects (e.g. *deil* 'devil' and *gie* 'give'), dated to the 14th century (Johnston 1997: 104). The continuity in the pronunciation of [f] and [v] in English and Scots, regardless of their phonemic status, is illustrated in Table 1.

Table 1: Continuity in the pronunciation of [f] and [v] in English and Scots.

	fish	**after**	**life**	**offer**	**seven**	**love**
OE Word	*fisc*	*æfter*	*līf*	*offrian*	*seofon*	*lufu*
OE Consonant	[f-] (/f/)	[-f-]	[-f]	[-ff-] /ff/	[-v-] (/f/)	[-v-]
Mod Scots	[f-] (/f/)	[-f-]	[-f]	[-f-]	[-v-] (/v/)	[-v]
Mod Eng	[f-] (/f/)	[-f-]	[-f]	[-f-]	[-v-] (/v/)	[-v]

So far so unremarkable. But when we examine spellings of these words in OSc sources such as the FITS corpus, things are less straightforward. OSc has two groups of spellings corresponding to OE and modern [f] and [v]. The first group, labelled '<F>' in this paper, consists of the spellings <f> and <ff> (at the ends of words these can be followed by a phonically empty <e>).[2] The second group, which we label '<V>', consists of a range of interchangeable spellings such as <v>, <u>, <vv> and <uu> (overwhelmingly followed by the same 'silent' <e> in word-final position). In initial position and morpheme internally, OSc consistently has <F> spellings for OE and ModSc (and English) [f]/[ff] (e.g. *fisch, eftir, offir*), and <V> spellings for OE and ModSc (and English) [v] (e.g. *sevin*), and thus appears to maintain the OE pronunciations of these consonants and to distinguish them orthographically. Table 2 summarises these patterns.

Table 2. *Spellings of etymological initial and morpheme-internal [f] and [v] in Older Scots.*

	fish	**after**	**offer**	**seven**
OE Word	*fisc*	*æfter*	*offrian*	*seofon*
OE Consonant	[f]	[f]	[ff]	[v]
OSc Spelling	<F>	<F>	<F>	<V>
OSc Consonant	[f]	[f]	[f]	[v]
Mod Scots	[f]	[f]	[f]	[v]
Mod Eng	[f]	[f]	[f]	[v]

But in morpheme-final position, OSc has variation between <F> and <V> spellings, both in cases where the consonant was final [f] in OE (as it still is in Modern English and Scots), e.g.

[2] There are three interpretations of final <e> in 15th-century Scots: (i) a residual schwa in final positions, which is very unlikely by this period unless intended as an archaism, particularly in verse (Aitken and Macafee 2002: 69-71); (ii) a diacritic of some kind, most typically a length-marker for the root vowel; (iii) an otiose element without phonological consequence.

lyfe, lyve ‘life’, and in cases where the consonant was intervocalic [v] in OE (final [v] in Modern English and Scots), e.g. *lufe, luvve* ‘love’. What is more, this variation between <F> and <V> spellings in morpheme-final position is also found pre-inflectionally in OSc, so that we get, for example, *liffis~lyvis* ‘lives’, and *luffit~lovit* ‘loved’. If we assume that OSc <F> spellings represent voiceless [f] and <V> spellings represent voiced [v], as they consistently do in initial and morpheme internal position, then there appears to have been variation between (etymologically) expected [f] and unexpected [v] in words like *life*, and between (etymologically) expected [v] and unexpected [f] in words like *love*, *lives* and *loved*. These apparent mismatches between OSc on the one hand and OE and ModSc (and English) on the other are summarised in Table 3 (unexpected OSc spellings highlighted).

These morpheme-final spellings in OSc represent something of a conundrum, given the straightforward agreement between the pronunciations of these consonants in OE and ModSc (and English). The otherwise regular correspondences between OSc <F> and <V> and etymological [f] and [v] suggest that OSc had variation between [f] and [v] in morpheme-final position, but that this variation disappeared before the ModSc period, and did so leaving the etymological distribution of these consonants unchanged. But is that the only possible explanation of these spellings and, even if it is, how might it have worked, given that it requires the development of a change and its subsequent reversal?

Tables 3. Spellings of etymological morpheme-final [f] and [v] in Older Scots.

	life	**love**	**lives**	**loved**
OE Word	*līf*	*lufu*	*līfes (gen.)*	*lufade*
OE Consonant	[f]	[v]	[v]	[v]
OSc Spelling	<F>, <V>	<F>, <V>	<F>, <V>	<F>, <V>
OSc Consonant	?[f] ~ [v]	?[f] ~ [v]	?[f] ~ [v]	?[f] ~ [v]
Mod Scots	[f]	[v]	[v]	[v]
Mod Eng	[f]	[v]	[v]	[v]

In this paper we consider this (our preferred) explanation for the variation between OSc <F> and <V> spellings in morpheme-final position, and two alternative explanations, one offered by Luick (1940), the other not suggested for this ‘change’ before but which is commonly invoked to explain such situations. These three explanations, then, are:

1) That variation between <F> and <V> is spelling variation only and does not indicate variation in pronunciation in particular words or etymological groups. This explanation, suggested by Luick (1940: 1,008), would mean that since no phonetic or phonological change had taken place, the OE values for these consonants were maintained into OSc and were inherited as such by ModSc. This hypothesis thus sidesteps the problem of reconciling the phonetic agreement of OE and ModSc with the OSc spellings. Nevertheless, this explanation also requires answers to a number of questions before it can be accepted. Why did OSc scribes decide that [f] and [v] in OSc could be written with the same symbols (<F> or <V>) in morpheme-final position when they rigorously kept these spellings distinct for [f] and [v] in other positions, and why did these variable spellings spread into pre-inflectional position but not elsewhere?

2) That the pronunciation of word-final [v] became very similar but not identical to [f] so that the difference between /f/ and /v/ was hard to discern and scribes could use the same symbols for both. This explanation, which has not been suggested before for this feature, relies on the notion of 'near merger' (Labov 1994: 293-418; see also Maguire et al. 2013). In situations of near merger, two phonemes become very similar so that their pronunciations are almost identical and may overlap to a large degree. Despite this considerable overlap, speakers consistently produce a minor difference in the pronunciation of the two phonemes, but are typically not aware that they do so and as a result they can rhyme instances of the two phonemes and spell them the same in, for example, dialect writing. Since cases of near merger often involve not just phonetic proximity but also phonetic overlap of two phonemic categories, these rhymes and identical spellings may in fact indicate phonetic identity (some of the time) without phonemic identity. Nevertheless, the pronunciations of the two phonemes are significantly different, and speakers learn this difference and can use it to distinguish the two categories (even if distinguishing individual tokens is sometimes impossible). In the case of OSc /f/ and /v/, this would mean that the pronunciation of the two phonemes became so similar that speakers and writers could not distinguish them or did not feel the need to distinguish them as they were often phonetically identical (though statistically different). Like the alternative explanations, this hypothesis also requires us to answer a number of questions before we can accept it as an explanation for the variable use of <F> and <V> spellings in morpheme-final position in OSc. Firstly, we need to suggest possible values for /f/ and /v/ in this situation of near merger and determine whether one or both of the phonemes changed in pronunciation. Secondly, we need to explain how these near merged pronunciations spread into pre-inflectional position. Thirdly, we need to determine when and how speakers separated the two phonemes out again given that they are pronounced differently in ModSc, and given that the difference between them has been important in the development of one of the most characteristic features of the phonology of Scots, the Scottish Vowel Length Rule (SVLR; Aitken 1981).
3) Returning to our preferred suggestion, perhaps variation between <F> and <V> spellings in morpheme-final position in OSc means exactly what it appears to: variation between [f] and [v] in this position. This explanation, which assumes the same faithful representation of the voiceless and voiced labiodental fricatives with <F> and <V> as is found in other positions in the word in OSc, requires a process of devoicing of OE [v] when it came to occur in final position as a result of final unstressed vowel loss (in words such as OE *lufu* 'love'), a process of voicing of final OE [f] (in words such as OE *līf* 'life'), and a spread of final [f], whether original or as a result of final devoicing, into pre-inflectional position (as in words such as OSc *liffis* 'lives' and *luffit* 'loved'). This is what we might call the 'standard' hypothesis, as it has been suggested before for Scots and northern ME (see Wright & Wright 1928: 108; Jordan 1934: 191; Mossé 1952: 40; Fisiak 1968: 61), though <V> for OE final [f] and the spread of the voiceless variant into pre-inflectional position have not been previously discussed. Johnston (1997a: 104) suggests that the devoicing of [v] in final position is "diagnostic of [Older] Scots as a whole … final /v/ is almost always represented by <f>, or the giveaway sign of voicelessness, <ff>". Although this explanation is attractive, it requires us to provide answers to a number of problems before it can be accepted as fact. In addition to

explaining why final [v] devoiced, why final [f] voiced, and how [f] spread to pre-inflectional position, we must explain why there is variation between <F> and <V> (according to this hypothesis [f] and [v]) in these words, and why there is no variation in ModSc, which has maintained the qualities that these consonants had in the OE period.

Determining which of these hypotheses best explains the variation in spelling that we see between <F> and <V> in OSc requires us to closely analyse the frequencies of these spellings in the two etymological sets and in word-final and pre-inflectional position and to bear in mind possible interactions with the phonotactic constraints that may have been in place at the time. With the extensive database of texts that underlies the FITS corpus, we are in a perfect position to do exactly this in a way that was not possible for previous researchers, and the data allows us to identify one hypothesis (the third one) as the best explanation for the observed patterns of variation and change.

4. The data

In this section we summarise the FITS data for OSc spellings of words with OE word-final and pre-inflectional /f/. In the rest of this paper, for convenience we use the following labels for the various categories under investigation:

- LIF — words with word-final /f/ in OE, e.g. *life* (<lif>, <lyf>, <lyfe>), *turf* (<turf>, <turfe>)
- LUFU — words with medial /f/ in OE which has become word-final in OSc, e.g. *leave* (<lef>, <leiff>, <leve>), *give* (<gyf>, <giffe>, <geve>)
- LIF+ — words with stem-final /f/ in OE followed by an inflectional suffix in OSc, e.g. *life* (<lyffis>, <lif(is)>, <lyvis>), *turf* (<turfis>, <turff(is)>, <turwiß>[3]
- LUFU+ — words with medial /f/ in OE which has become stem-final in OSc and which is followed by an OSc inflectional suffix, e.g. *leave* (<leff(is)>, <lefit>, <levis>, *give* (<givis>, <giffin>, <geui(n)>

The number of tokens of each of these categories in the FITS corpus is as follows: LIF = 612; LUFU = 2103; LIF+ = 50; LUFU+ = 870. The small number of tokens available for LIF+ means that any interpretation of the spellings for this group must be treated with caution.

As noted previously, the profusion of OSc spellings of OE /f/ have been grouped under two labels, <F> and <V>. Whilst the difference between <F> and <V> spellings is shown in this paper to vary significantly according to a range of linguistic and non-linguistic factors, the differences between each of the spellings within the two categories are essentially insignificant, at least with regard to the questions addressed in this paper, and thus these are not investigated further.

[3] Inflectional suffixes begin in a voiced sound, typically a vowel, in OSc; in most cases the unstressed vowel in inflectional suffixes has clearly survived, as indicated by <i> and <y> spellings of it (see King 1997 and Smith 2018 for discussion).

Figure 1: The frequency of <F> and <V> spellings in LIF and LUFU.

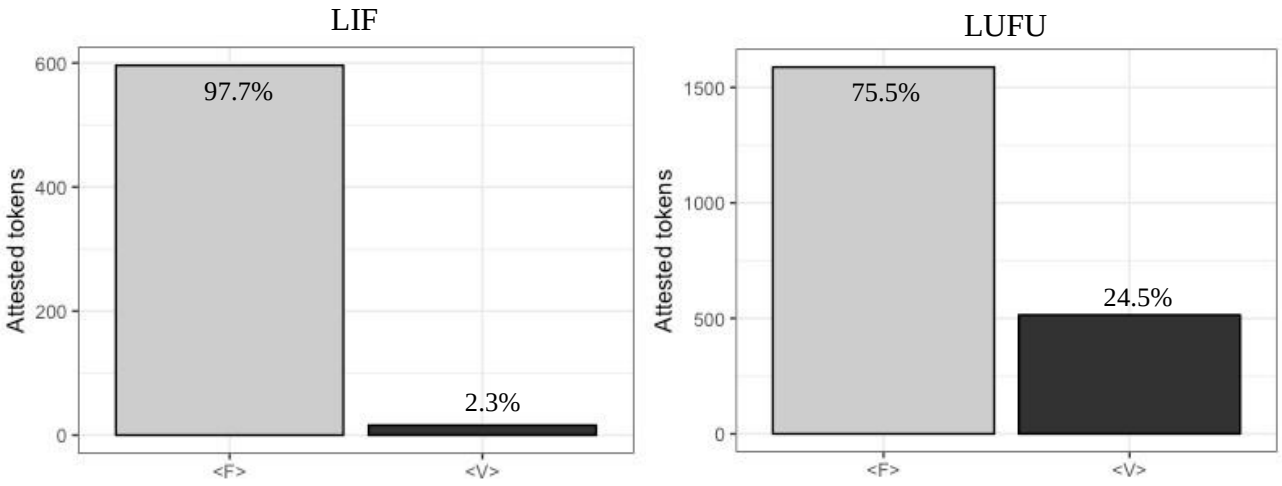
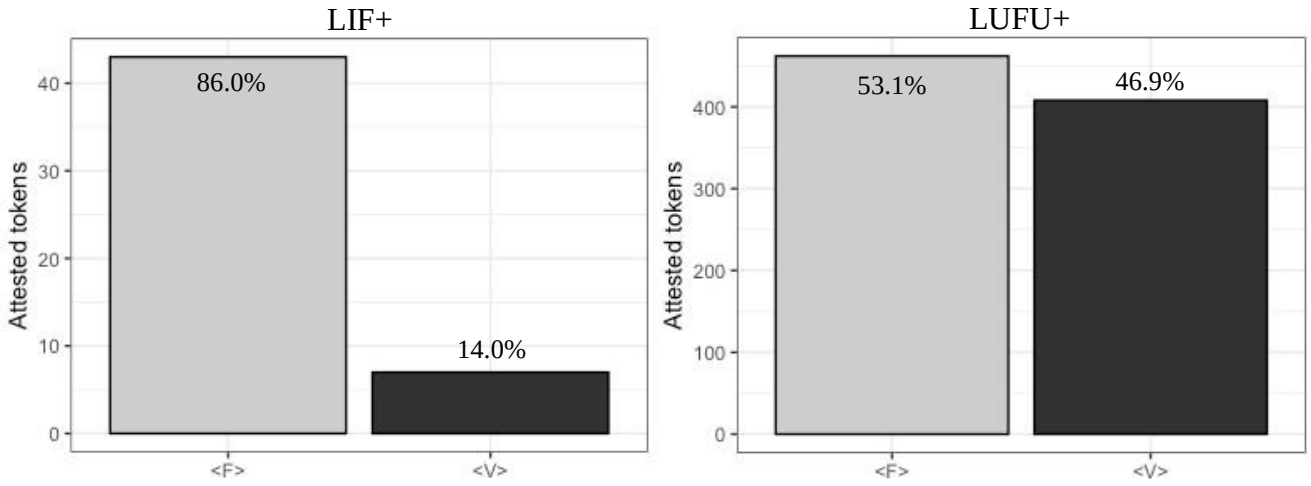


Figure 1 illustrates the frequency of <F> and <V> spellings for the LIF and LUFU groups (number of attestations with percentages). <F> spellings predominate in both groups, though they are significantly more common for LIF than for LUFU.[4] Indeed, <V> spellings for LIF words are rare, as we might expect, given that these words had [f] in OE. Crucially, every one of the <V> spellings of LIF is found in the words *half* and *life*, where etymological confusion with adjectival or verbal forms (*halve*, *(a)live*) may explain the minority spellings.[5] In other words, OSc appears to show a direct correspondence between <F> spellings and OE [f] in LIF words. Conversely, <V> spellings for LUFU words are rather more common, constituting a quarter of tokens, and, given that these words had [v] in OE, the high frequency of <F> spellings in these words is striking.

Figure 2 illustrates the frequency of <F> and <V> spellings in the LIF+ and LUFU+ groups (again with numbers of attestations and percentages). As noted previously, the small number of LIF+ tokens means that the frequencies of <F> and <V> spellings for the group must be interpreted cautiously. Nevertheless, there is a striking (and significant) difference in the frequency of <F> and <V> spellings for LIF+ and LUFU+, even though the two groups had [v] in OE.[6] It is noteworthy that in both cases the levels of <V> spellings are much higher (significantly so) in pre-inflectional position than in word-final position (Figure 1). Despite this, however, both groups also have a majority of <F> spellings.

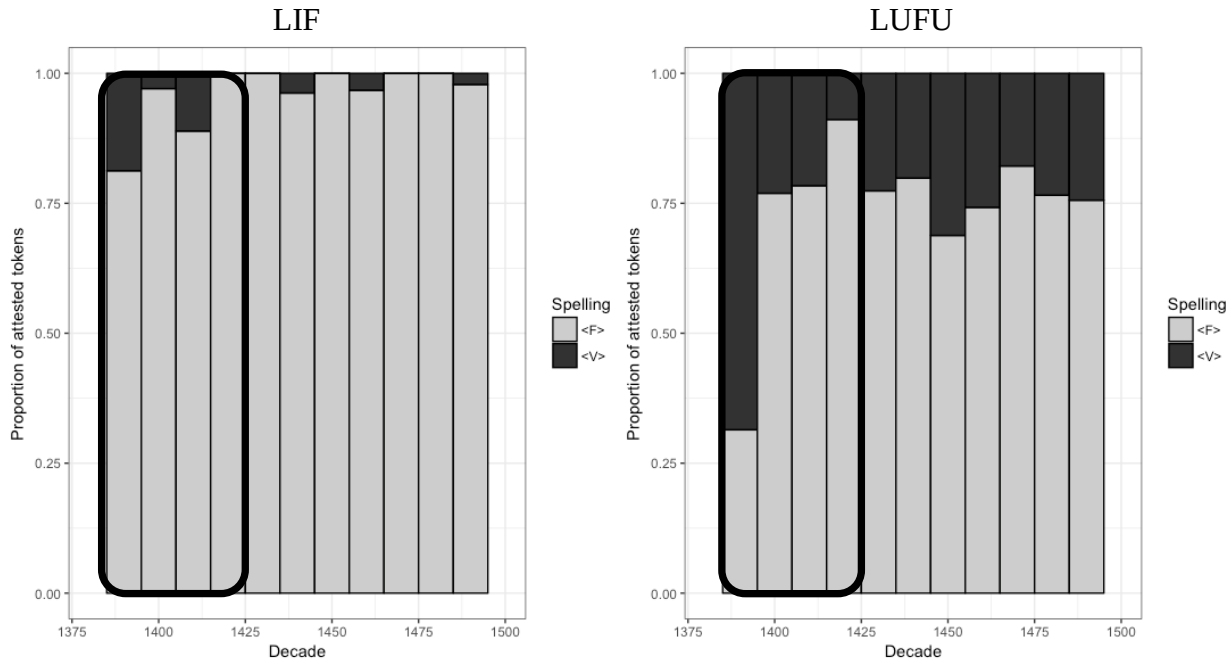
[4] χ^2 (1) = 144.0, $p < 0.001$.
[5] A similar situation is evident in some non-standard dialects of modern English and Scots, whereby *calf* (n.) and *half* may be pronounced [kɑ:v] and [hɑ:v] due to confusion with *calve* and *halve* (Wright 1905: 363, 471).
[6] χ^2 (1) = 20.7, $p < 0.001$.

Figure 2: The frequency of <F> and <V> spellings in LIF+ and LUFU+.



An examination of the frequencies of <F> and <V> spellings in the four groups across the time-span of the FITS corpus (Figures 3 and 4) reveals a number of interesting patterns, though the low number of tokens of LIF+ means that the figures for that group do not mean a great deal. Since the number of texts (and hence tokens) in the FITS corpus is much lower for the period 1385-1425 (boxed in Figures 3 and 4), the frequencies of <F> and <V> spellings for the first few decades of the period covered by the FITS corpus (indicated in Figures 3 and 4) must also be interpreted with caution.

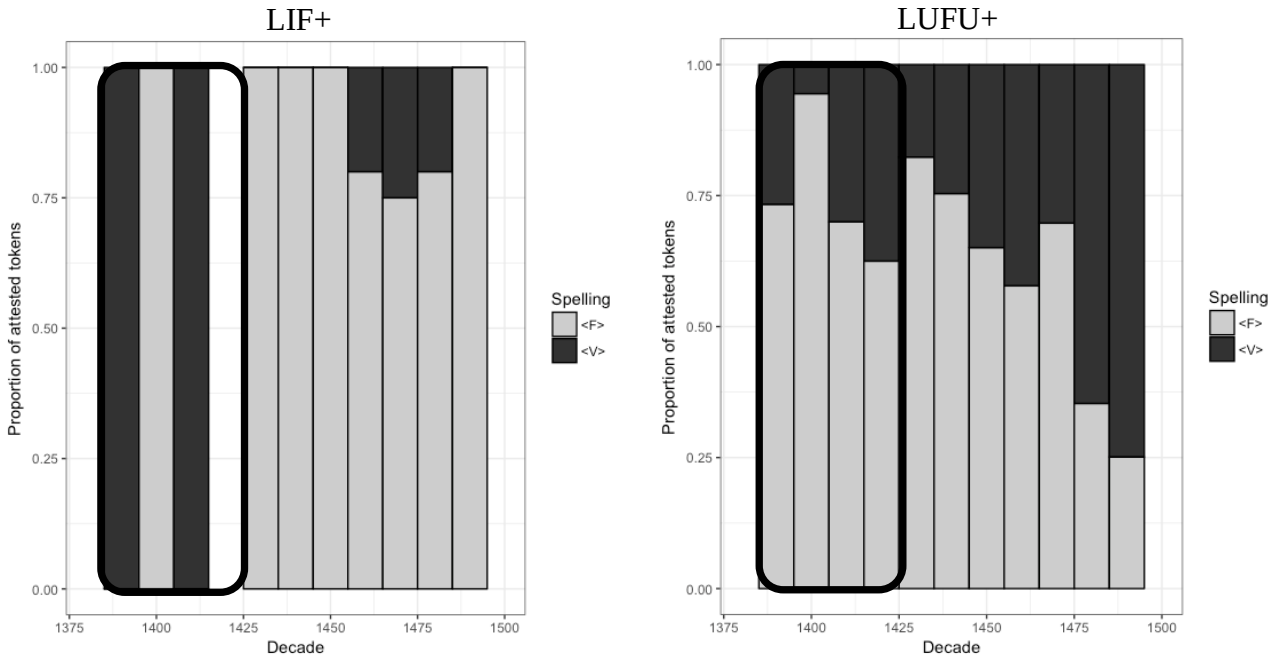
Figure 3: The frequency of <F> and <V> spellings in LIF and LUFU per decade, 1385-1495.



The figures for LIF and LUFU through the decades from 1385-1495 reflect the overall differences in the frequencies of <F> and <V> spellings for the two groups, and also show that these differences are constant and essentially unchanging throughout the period (the somewhat atypical frequencies of <F> spellings in both sets in the first four decades is a result of the small number of available tokens from the end of the 14th and start of the 15th centuries). With reference to the pre-inflectional groups, the number of LIF+ tokens means that no firm conclusions can be drawn about the behaviour of this set, whilst the frequency of <F> spellings in LUFU+ shows a marked decline in the 15th century, from a level of nearly 80% in 1425-1435 to under 25% in 1485-1495 (again the figures for the first four decades in the period are based on rather few tokens).

The analysis of the frequency of OSc <F> and <V> spellings for OE /f/ may be summarised as follows. Although allophones of OE /f/ in initial and morpheme-internal position are consistently represented by OSc <F> and <V> spellings respectively, indicating continuity in the pronunciations [f] and [v], the situation in morpheme-final position is more complex. Where OE /f/ occurred in word-final position (pronounced [f]; the LIF group), it is almost always represented with <F> spellings in OSc, the few exceptional <V> spellings occurring only in words where etymological confusion between nominal and adjectival/verbal stems is possible. Where OE /f/ occurred in morpheme-internal intervocalic position in OE (pronounced [v]) but where this consonant ended up in word-final position in OSc due to unstressed final vowel loss (the LUFU group), levels of <F> spellings are also high, but there is a not-insignificant amount of <V> spellings too (24.5%). In the LIF+ and LUFU+ groups, which both had [v] in OE, levels of <F> spellings are also high. This is especially the case in LIF+, whilst LUFU+ is close to having half-and-half <F> and <V> spellings. This difference in the frequency of <F> and <V> spellings for these two groups cannot reflect an etymological difference (since both had [v] in OE), but correlates to an extent with the frequency of <F> and <V> spellings in the uninflected LIF and LUFU groups. Finally, whilst the frequency of <F> spellings in LIF and LUFU remains unchanged through the period of the FITS corpus, the frequency of <F> spellings in LUFU+ declines substantially throughout the 15th century.

Figure 4: The frequency of <F> and <V> spellings in LIF+ and LUFU+ per decade, 1385-1495.



5. Discussion

Having reviewed the data for <F> and <V> spellings in morpheme-final position in the FITS corpus, we are now in a position to assess the strengths and weaknesses of the three hypotheses given in Section 3 and to determine which of them is the best explanation for the variation that we see in OSc. Despite a number of apparent difficulties with it, Hypothesis (3), final devoicing of [v] in OSc, is the explanation which best fits with the OSc data and with our understanding of the nature of phonological change.

5.1. Hypothesis (1), a spelling-only change

This explanation (suggested by Luick 1940: 1,008) has the advantage that it requires no change in the pronunciation of [f] and [v] and thus no reversal to engineer the identical distribution of these sounds in OE and ModSc. Under this scenario, word-final [v] could be spelled as <F> and, conversely, word-final [f] could be spelled as <V>. Furthermore, by 'spelling analogy' the final <F> in both LIF and LUFU words spread into non-final pre-inflectional position, but this analogical spelling was on the wane throughout the 15th century (and of course does not survive in ModSc spelling, which is only partially derived from OSc spelling in any case; see Kniezsa 1997). But whilst this explanation seems to offer a straightforward way of accounting for the apparent mismatch between OSc on the one hand and OE and ModSc on the other, it begins to run into problems when we consider the data more closely.

Firstly, it must be recalled that OSc scribes rigorously assigned <F> and <V> spellings to etymological (and ModSc) [f] and [v] respectively in initial and morpheme-internal position. Why, then, when they had the means to do so, did they not also distinguish them in morpheme-final position? The FITS corpus reveals that this was not just an occasional respelling, but a very frequent one, at least in the case of using <F> where we would expect [v] (75.5% of the time in word-final position, i.e. in the LUFU group). Given that scribes had the means to distinguish [f] and [v], why did they so often choose not to? It is noteworthy, too, that this only worked one way; assuming that this hypothesis is correct, OSc scribes were very willing to use <F> for [v] in morpheme-final position, but rarely used <V> for [f] in the same position. If the two consonants could be represented the same way in this position in the word (but not in others), why was it almost always <F> that was used? Indeed, the examination of the FITS data in Section 4 suggests that the situation may have been even more extreme than that. Since all of the cases of <V> for word-final [f] in the data can be accounted for by appealing to etymological mix up with adjectival and verbal forms, then it is possible that there were *no* genuine cases of final [f] in OSc being spelled as <V>. In other words, not only were scribes extremely consistent in distinguishing [f] and [v] orthographically in initial and morpheme-internal position, they also made sure to use <F> only for final [f], but were quite happy to use <F> *and* <V> for final [v] (i.e. to sometimes make the distinction they do elsewhere and to sometimes not). We are asking a lot of the OSc scribes here, but perhaps it is possible that they had an aversion (though not an absolute one) to representing final [v] with <V>, so that <F> became a preferred orthographic representation of [v] in word-final position.

But in fact the idea that OSc scribes had an aversion to using <V> for [v] in final position is even weaker when we consider how they actually spelt these words. It is not the case that the spellings representing [v] usually occurred in absolute final position. Words in the

LUFU group are often written with phonetically empty <e> following the <F> or (especially) <V> (though in some cases they are indeed word-final, e.g. *fyv* 'five'), e.g. *lufe*. What this means is that the scribes dispreferred <V> for final [v] (in the pronunciation), even though the symbol they used for this sound was almost never in final position orthographically. It is not clear how they could have distinguished this spelling practice (i.e. representing word-final [v] as <F> in non-final orthographic position) from their rigorous use of <V> for morpheme-internal [v] in non-final orthographic position (as in *sevin*). It is unclear what their motivation for spelling word-final [v] as <F> would be in such cases given that orthographically nothing need have been different than for the representation of morpheme-internal [v]. When we add to this the necessity of invoking ad hoc spelling analogy, which involved the variable spread of (often non-final) <F> for final [v] to pre-inflectional [v] and which never affected the spelling of non-final <V> for morpheme-internal [v] (cf. *sevin*), the case for this explanation is at best weak.

5.2. Hypothesis (2), near merger of final [f] and [v] in OSc

Although this explanation requires a change in word-final [f], [v] or both, it appears to provide an explanation as to why there has apparently been no change between OE and ModSc in the distribution of these consonants – nothing changed phonemically, and since a near merger is not an actual merger, it can be (indeed will be if it is at all) reversed without error (Labov 1994).

A reasonable scenario in this near merger is that pre-OSc [v] became devoiced (at least some of the time) to [v̥] in word-final position, but was still distinguished from [f] in some way, perhaps in its length or intensity, at least statistically (see Labov 1994 for numerous examples of near merger, indeed phonetic overlap, of phonemes which are nevertheless statistically distinct). Because this [v̥] was phonetically close to [f] and could not easily be distinguished from it, scribes wrote it as <F>. But since they knew (if not consciously) that [v̥] was /v/, not /f/, or since the pronunciation of /v/ ranged from [v] to [v̥], they also sometimes wrote it as <V>. This would account for the variable spelling of word-final /v/ in OSc in LUFU words (which in the FITS corpus has a ratio of 75.5% <F> to 24.5% <V> spellings).

However, as with hypothesis 1, there are problems with this initially promising explanation. As was described in Section 4, and discussed further for hypothesis (1) in Section 5.1, variation between <F> and <V> spellings in word-final position is only characteristic of LUFU words, not LIF words (especially since the few LIF words with <V> can be explained in other ways). If /f/ and /v/ were in a situation of near merger, such that scribes were happy to spell /v/ ([v̥]) as <F>, why were they not equally happy to spell /f/ ([f]) as <V>? The whole point in the near merger explanation is that they could not phonetically tell which phoneme was involved, and if this was true for [v̥], then it must equally have been true for [f]. We would expect, under this scenario, a noticeable rate of <V> spellings for /f/, rather than the near complete absence of such spellings that we see in the FITS corpus. The only way to explain this is that the scribes knew which phoneme underlay the ambiguous word-final realisations, so that they could avoid using <V> in the LIF group, and indeed could employ <V> at a rate of 24.4% for the LUFU group. That the scribes must have been aware of the distinction and could operationalise it in spelling takes away the whole point of this explanation.

There are further problems too. In many dialects of ModSc, final /v/ is, like other voiced obstruents, often pronounced with reduced voicing, as [v̥], though it is still distinguished, as are the other underlyingly voiced obstruents, from its voiceless counterpart. Given how similar this situation is to the hypothesised near merger in OSc, it is tempting to see a continuation of the OSc realisation of these consonants in ModSc (otherwise we need partial devoicing of /v/ to [v̥], then revoicing to [v], then partial devoicing again to [v̥]). However, speakers and writers of Scots today appear, regardless of the pronunciation of the two phonemes, to be aware of the phonemic distinction between them, and there is no evidence of the widespread confusion between the two phonemes that is required to produce the spelling variation seen in OSc. As was noted previously, ModSc is characterised by the SVLR, a phonological constraint which specifies that (certain) vowels are long before voiced fricatives (including those in word-final position), morpheme boundaries, schwa, and /r/, and are short elsewhere. This constraint arose as a result of lengthening of short vowels in these environments and a shortening of long vowels outside of these environments. These regular changes, dated by Aitken & Macafee (2002: 129-130) to before the late 16th century, depend upon a definite, phonetically motivated phonological distinction between voiced and voiceless fricatives in the history of Scots. In the SVLR, voiced stops, nasals and /l/ group with voiceless consonants in the short(ening) environment, whilst voiced fricatives group with morpheme boundaries, /r/ and schwa in the long/lengthening environment. If the voiced fricatives were in fact phonetically voiceless, why would they have acted this way, especially when the nasals and /l/, which are sonorants, so not subject to general final obstruent devoicing, were short environment consonants? Similarly, if the voiced fricatives devoiced as part of a general obstruent devoicing change, as seen in ModSc, why did they affect vowels differently than the voiced stops? It is not clear that such a difference and the changes which depended on it would have existed had the proposed OSc near merger of /f/ and /v/ still been in operation in the 16th century. That being the case, a phonetic (voicing) separation of /f/ and /v/ after the OSc period (which would of course have been possible as they were not truly merged) must indeed have occurred, something which is necessary in any case to account for ModSc dialects with final voiced [v]. But following this, final /v/ in Scots must once again have devoiced, to [v̥], in many dialects. Whilst all of this is just about possible, it involves a lot of assumptions that we just don't have evidence for.

Furthermore, there are two other pieces of evidence against the near merger explanation. The first of these is the presence of a single Scots word which began life with [v] but which is now found in some Scots (and northern English) dialects with [f] (i.e. /f/). This is the word *nieve~nief* 'fist'. This word originates in Old Norse *hnefi*[7] which was adopted, according to the rules of OE, with [v]. With loss of final unstressed vowels in English, this [v] would have come to stand in word-final position, where, according to the near merger explanation, it would have devoiced to [v̥]. As Labov (1994: 306) is at pains to point out, when a near merger is reversed the reversal is "clean and complete", so that there should be no cross-overs between the two original phonemes. But here we have exactly this, a cross-over, in some dialects at least, of *nieve* [niːv] to *nief* [nif]. The whole point in the near merger explanation is to show that this did not happen, and why, so this exception is unexplained. The second problem involves the spread of <F> spellings to pre-inflectional position (in LIF+ and LUFU+)

[7] "nieve, n.". OED Online. March 2018. Oxford University Press. http://www.oed.com/view/Entry/126882?redirectedFrom=nieve (accessed April 19, 2018); "Nieve n., v.". *Dictionary of the Scots Language*. 2004. Scottish Language Dictionaries Ltd. http://www.dsl.ac.uk/entry/snd/nieve (Accessed 30th November, 2018).

in OSc. Near merger must, by its very nature, be a sub-phonemic change, since it does not disrupt a phonological distinction. In this case it was a change conditioned by the phonetic environment: /v/ devoiced in word-final position. This kind of sub-phonemic conditioned realisation cannot spread by analogy to pre-inflectional position, since its structural specifications are no longer met (i.e. it is no longer in the devoicing environment): a sub-phonemic rule of word-final devoicing cannot apply to a non-final consonant (see Kiparsky 2003). Analogy works on categories (e.g. phonemes), not realisations of categories. The only way the voiceless pronunciation could spread to pre-inflectional position by analogy is if it had crossed the phonological boundary and become /f/, which did occur between vowels in OSc (e.g. in *offer*). But of course that means that this would not have been a near merger at all, but a full merger of /f/ and /v/ in final position (as discussed under Hypothesis 3 in Section 5.3). These two problems show that the near merger explanation of variation between <F> and <V> in morpheme-final position in OSc is also untenable.

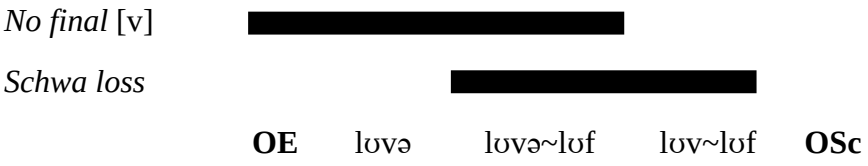
5.3. Hypothesis (3), final [v] devoiced to [f] in pre-OSc

This leaves us with option (3), that final [v] devoiced to [f] in pre-OSc, becoming identical to pre-existing final [f], and thus could be spelt the same way, as <F>. As noted in Section 3, this explanation has the advantage that we can assume that the OSc scribes knew what they were doing in using <F> or <V> (as they did in other positions in the word), but it requires us to explain: (i) the changes which are represented by these spellings; (ii) how word-final <F> spread to pre-inflectional position; and (iii) how this change has disappeared from Scots. None of these are trivial concerns, but we believe that they can be addressed by examining the wider context of this change.

Dealing first with (i), the change and its apparently variable nature, two process appear to have been involved. Firstly, there was the loss of final unstressed vowels (which had already reduced to schwa), leading to formerly morpheme internal [v] appearing in word-final position (e.g. OE *lufu* [lʊvʊ] 'love' > [lʊvə] > [lʊv]). Minkova (2014: 231) argues that schwa loss was an initially variable change and that after a long period of variation it was probably complete in English by 1450, though it likely reached this stage earlier in the north. Thus the change was actually OE [lʊvʊ] > [lʊvə]~[lʊv] > [lʊv]. Secondly, there was, assuming that Hypothesis 3 is correct, devoicing of final [v] to [f]. We may reasonably expect this change to have affected the other voiced fricatives ([ð] and [z]) in final position too, though evidence for this is unavailable given the lack of orthographic distinction between [θ] and [ð] and [s] and [z] throughout much of the history of English and Scots. If this devoicing change happened during the period when schwa loss was variable (e.g. [lʊvə]~[lʊv]), let's say in the 13th-14th centuries, then it would only have affected those instances where schwa was absent (since it was a change affecting word-final [v] only), leading to variation of the kind [lʊvə]~[lʊf]. If this devoicing change then ceased to apply before schwa loss was complete (we know that schwa loss took a long time to come to completion), the result would be variation of the sort [lʊv]~[lʊf], i.e. exactly the sort of variation we see represented in the variable <V> and <F> spellings for the LUFU group in OSc.

In fact, this may be over-complicating things. We know that OE had a phonotactic restriction on the occurrence of voiced fricatives in word-final position. That is, OE already had what was, in effect, a word-final [v] (and [ð] and [z]) devoicing rule. Rather than assuming

the disappearance of this rule and then the reintroduction of a new final [v] (or final fricative) devoicing rule in pre-OSc, it is more parsimonious to assume that this phonotactic restriction continued after the OE period in the north, even though the distinction between [f] and [v] was becoming phonemic in other environments.[8] That is, the phonotactic constraint survived the significant changes to the phonemic system to which it originally applied. This means that by the time variable schwa loss began, there was a constraint in place against final voiced fricatives (whatever their phonemic status elsewhere in the system), so that any fricative which ended up in word-final position was by default voiceless. Thus we can remove one step in the changes outlined above, and posit a change of OE [lʊvʊ], via [lʊvə], to pre-OSc [lʊvə]~[lʊf]. But as schwa loss continued towards its conclusion, the phonotactic constraint, surviving from the OE period, against word-final voiced fricatives must finally have come to an end, probably indeed as a result of further schwa loss producing the potential for lots of word-final voiced fricatives (which of course by this stage in the history of the language were phonemically distinct from the voiceless fricatives, as noted in Minkova 2011: 46). We can illustrate the interaction of these changes as follows:



The simple interaction of variable final schwa loss (completed before our earliest OSc records from the late 14th century) with the OE constraint against final voiced fricatives (which must have ceased to operate before schwa loss completed) would have produced exactly the situation we appear to see recorded by the OSc scribes as variation between <F> and <V> spellings in LUFU words (assuming that by <F> they meant [f] and by <V> they meant [v]). The FITS corpus reveals that 75.5% of LUFU words ended in <F> and 24.5% in <V>, suggesting that schwa loss was at a fairly advanced stage before the constraint against final voiced consonants in pre-OSc ended. Of course, the scenario just outlined does not explain why there are some final <V> spellings in LIF words. However, as was discussed in Section 4, these <V> spelling in LIF are entirely restricted to words which have adjectival and verbal counterparts with etymological [v], and probably represent etymological or orthographic confusion. Thus we do not need to invoke any change in original final [f], which is essentially represented regularly by <F> ([f]) in OSc.

Explaining (ii), how final <F> ([f]) spread into pre-inflectional position, a possible answer suggests itself when we consider what the situation must have been before this change. Prior to the spread of [f] into pre-inflectional position, words of the LIF group ended in [f], words of the LUFU group ended in [f] or [v], whilst words in both the LIF+ and LUFU+ groups would have had [v], inherited from OE. That is, the morphological alternation between LIF and LIF+ involved phonological alternation between [f] and [v], whilst the morphological

[8] Minkova (2011: 46) notes that the establishment of the [f]-[v] contrast in final position in English as a result of schwa loss would have required the phonemic distinction between /f/ and /v/ in other positions in the word to have already become established. We are arguing here that the reverse need not be true: the establishment of the /f/-/v/ contrast in other positions in the word did not (initially) mean that this contrast was possible in word-final position.

alternation between LUFU and LUFU+ involved phonological alternation between [f]~[v] and [v]. This kind of allomorphy is exactly the place we expect to see analogical levelling (Hock 1986: 167-171), a categorical but variable process, and one which is applicable in this case in particular since the difference between [f] and [v] was phonemic in the language, not just positionally determined. Thus if we get [liːf]~[liːvəs] 'life~lives' and [lʊf]/[lʊv]~[lʊvəs] 'love~loves', we have every reason to expect analogical spread from the basic form to the inflected form (e.g. [liːf]~[liːfəs]). Indeed, precisely such a change is evident in ModSc in, for example, the nouns *hou*[s]*e~hou*[s]*es* and *wi*[f]*e~wi*[f]*es*.[9] In fact, it is possible that these ModSc forms represent a continuation of this analogical levelling from the OSc period. So by well known principles of linguistic change in the context of language specific phonotactics, we can readily get the kind of variation between [f] and [v] that we see represented as variation between <F> and <V> in pre-inflectional position in OSc. As was noted above, analogical levelling is necessarily variable, both between and within lexical items. This inherent variability accounts for the variability in <F> ([f]) and <V> ([v]) in pre-inflectional position in LIF+ and LUFU+. But how do we account for the difference in the frequencies of <F> in LIF+ (86.0%) and LUFU+ (53.1%)? Assuming that this is not just a statistical blip due to the small number of LIF+ tokens (see Section 4), this must depend on the extent to which [f] was present in the uninflected LIF and LUFU forms throughout their history. In the case of LIF, it always had final [f], so analogical spread of this to pre-inflectional position was possible from the point that [f] and [v] diverged phonemically in the language, and was just as likely in the OSc period given the near exclusive presence of [f] in word-final position in this group. LUFU words, on the other hand, only ever had variable [f] in final position (and indeed for much of their history did not have [f] at all), so that even by the OSc period there was variation between [f] and [v] in final position (albeit with [f] occurring at a rate of 75.5%). This means that compared to the LIF(+) group there was less analogical pressure for the [f] to spread to pre-inflectional postion in the LUFU(+) group, though even here it did, in just over half of the relevant tokens in the period covered by the FITS corpus.

As for explaining problem (iii), how this change disappeared from Scots, here we move into somewhat more speculative territory, since this change largely occurred after the period documented by the FITS corpus, at a time when Scots was increasingly coming under the influence of English. Nevertheless, the solution to this problem must also lie in the variable nature of final [v] devoicing in OSc described in this paper. In cases of variation between [f] (/f/) and [v] (/v/), i.e. in LUFU, LIF+ and LUFU+, it is possible for speakers to generalise one or other of the variants, since they have not merged (in the terminology used by Maguire et al. 2013, they have a 'variable merger'). Thus in these groups, variation between [f] and [v] was ultimately simplified to pronunciation with [v] only. This is not possible in the LIF group, which only ever had [f]. We can already see this happening in the LUFU+ group in the FITS data, with <F> spellings decreasing dramatically through the 15th century (Figure 4), though the level of <F> spellings for uninflected LUFU remains constant. It is likely that this simplification of variation in pre-inflectional position in LUFU+ in the 15th century sparked a similar reduction in variation in uninflected LUFU. This can only have been helped by the close relationship between English and Scots throughout their histories and the increasing

[9] The levelling can go in the other direction too, from the inflected to the basic form, though this is less common. A modern example is [liːv] for 'leaf', found in some modern English and Scots dialects. It may also be an explanation for forms such as *calve* and *halve* for 'calf' and 'half' in some modern dialects and OSc, though etymological confusion between nominal and adjectival/verbal stems is also possible, as described in this paper.

influence of English on Scots from the 16th century onwards. Although Scots and English in the OSc period should be considered to be two different though closely related languages, they formed, in the words of Williamson (2002: 253) "a common speech area", characterised by many shared changes, including such complex innovations as the set of changes involved in the Great Vowel Shift (Lass 2000). In other words, Scots was as likely to share changes with English as to diverge from it throughout its history. This being the case, the devoicing of final [v] in Scots put it out of step with English (other than some northern dialects, as noted in Section 3) and, as a result of 'pan-Anglic pressure', Scots ultimately realigned with English in this respect, simplifying the variation between [f] and [v] in LUFU, LIF+ and LUFU+ to [v]. Thus morpheme-final devoicing of [v] in Scots was reversed, with variation in the word *nieve~nief* remaining as the sole witness to this one-time change, perhaps because this word did not occur in most English dialects and thus escaped the pan-Anglic pressure which affected other words of the same type. The existence of pronunciations such as *hou*[s]*es* and *wi*[f]*es* in ModSc exemplifies the kind of analogical pressure which once brought final [f] into pre-inflectional position in the language, and indeed may indicate survival of this change in the poorly documented OSc LIF+ set.

The comparison of the three explanations for the variation between <F> and <V> spellings in LIF, LUFU, LIF+ and LUFU+ words in OSc in this section has shown that while explanations (1) (spelling-only change) and (2) (near merger) initially appear to offer solutions to various problem, they ultimately fall down on closer inspection. Explanation (3), on the other hand, involves further explanation of a number of non-trivial problems, but these are resolvable once we set them in the wider context of the changing phonotactics of the language. Ultimately, the interaction of final schwa loss and the continuation (for a time) of the OE constraint against final voiced fricatives led to variable analogical levelling, which in turn gave rise to the variation we see in the OSc texts. The subsequent retreat of this final devoicing change is a result of this ongoing variation and long-term pan-Anglic pressure, leading Scots, which had diverged in this respect, to eventually realign with English.

6. Conclusions

The profusion of spelling variants in medieval manuscripts is often daunting and this brings with it disadvantages (e.g. difficulty in interpretation) and advantages (e.g. an insight into the phonetics and phonology of the scribes' dialects). This paper shows that a detailed analysis of variation in Older Scots spelling pays rich dividends: the spellings (in the case of <F> and <V> at least) are not random, and when considered in the context of the phonological history of the language, they tell a coherent and illuminating story of variation and change. In so doing, they illustrate the value of corpora such as FITS and persuade us that much can be learned about the phonological history of English in its widest sense through detailed analysis of carefully constructed databases of historical texts.

Being able to interpret seemingly unsystematic spellings opens up new vistas on important sound changes in the history of the language. In particular, the spelling evidence in FITS is compatible with a change whereby OE [v], when it came to occur in final position due to loss of schwa, devoiced to [f]. That this change resulted in variation between final [f] and [v] (as indicated by variation between <F> and <V> in spelling), is the result of the interaction of this devoicing with the long drawn out loss of schwa in the language. Ultimately the

devoicing process ceased to operate before schwa loss was complete. Other explanations for the variation in spelling change are considerably less satisfactory.

But from a more general viewpoint, this change in OSc is much more than a simple process of final devoicing. It represents a case where a phonotactic constraint operating on the distribution of allophones the OE fricatives survived the phonemic split which turned these allophones into phonemes. After this phonemic split, it continued to operate in pre-OSc as a phonotactic constraint against the occurrence of voiced fricative phonemes in word-final position. Thus the devoicing of [v] in final position in pre-OSc was not just a phonetically natural sound change, but also one driven by a pre-existing phonotactic constraint, even though the system the constraint was acting upon had changed its status. And it was this change in status that enabled these word-final voiceless fricatives to spread into pre-inflectional position, where previously they had been impossible, thus further entrenching the distinction between the voiced and voiceless fricatives in the language.

Ultimately, the variable nature of this change and the influence of the ever-dominant English led to the demise of this phonotactically motivated change in Scots, leaving the seemingly chaotic spellings of the Older Scots scribes as almost the only evidence that such a change ever took place. But with these spellings subjected to grapho-phonological parsing in the FITS corpus, we are now in a position to understand some of the reasons why they wrote as they did (as Laing and Lass 2003: 258 put it "The apparent disorder of many of these systems is an artefact of our *own* present lack of understanding") and to take advantage of the sophistication evidenced in their spelling practices to understand better the phonological history of the language.

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